LESSON 4.3

NAME _____ DATE _____

Practice with Examples

For use with pages 212–219

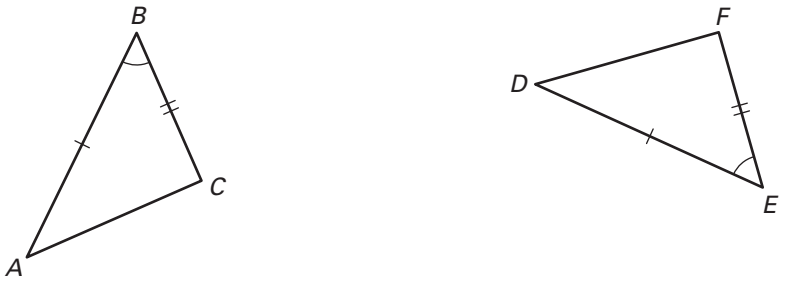
GOAL **Prove that triangles are congruent using the SSS and SAS Congruence Postulates**

Postulate 19 Side-Side-Side (SSS) Congruence Postulate
If three sides of one triangle are congruent to three sides of a second triangle, then the two triangles are congruent.

Postulate 20 Side-Angle-Side (SAS) Congruence Postulate
If two sides and the included angle of one triangle are congruent to two sides and the included angle of a second triangle, then the two triangles are congruent.

EXAMPLE 1 Using the SAS Congruence Postulate

Prove that $\triangle ABC \cong \triangle DEF$.



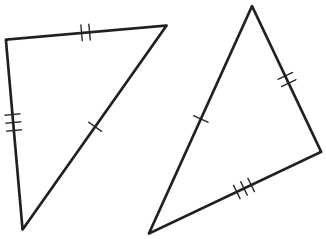
SOLUTION

The marks on the diagram show that $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, and $\angle B \cong \angle E$. So, by the SAS Congruence Postulate, you know that $\triangle ABC \cong \triangle DEF$.

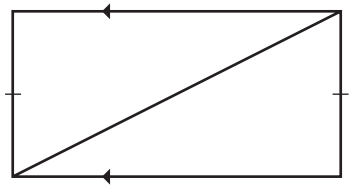
Exercises for Example 1

State the congruence postulate you would use to prove that the two triangles are congruent.

1.



2.



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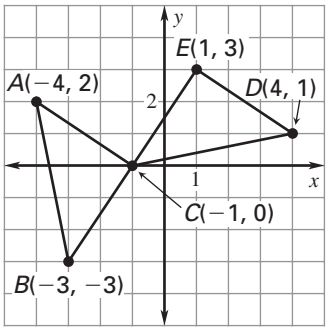
EXAMPLE 2 Congruent Triangles in a Coordinate Plane

Use the SSS Congruence Postulate to show that $\triangle ABC \cong \triangle CDE$.



SOLUTION

Use the distance formula to show that corresponding sides are the same length. For all lengths, $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$.

$AB = \sqrt{(-3 - (-4))^2 + (-3 - 2)^2}$
$= \sqrt{1^2 + (-5)^2}$
$= \sqrt{26}$

$CD = \sqrt{(4 - (-1))^2 + (1 - 0)^2}$
$= \sqrt{5^2 + 1^2}$
$= \sqrt{26}$

So, $AB = CD$, and hence $\overline{AB} \cong \overline{CD}$.

$BC = \sqrt{(-1 - (-3))^2 + (0 - (-3))^2}$
$= \sqrt{2^2 + 3^2}$
$= \sqrt{13}$

$DE = \sqrt{(1 - 4)^2 + (3 - 1)^2}$
$= \sqrt{(-3)^2 + 2^2}$
$= \sqrt{13}$

So, $BC = DE$, and hence $\overline{BC} \cong \overline{DE}$.

$CA = \sqrt{(-4 - (-1))^2 + (2 - 0)^2}$
$= \sqrt{(-3)^2 + 2^2}$
$= \sqrt{13}$

$ED = \sqrt{(4 - 1)^2 + (1 - 3)^2}$
$= \sqrt{3^2 + (-2)^2}$
$= \sqrt{13}$

So, $CA = ED$, and hence $\overline{CA} \cong \overline{ED}$.

So, by the SSS Congruence Postulate, you know that $\triangle ABC \cong \triangle CDE$.

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Exercise for Example 2

3. Prove that $\triangle ABC \cong \triangle DEF$.